

CLAIMS

What is claimed is:

1. A process for preparing a composite material comprising mixing at least one natural fiber, at least one polyolefin resin, and at least one functionalized polyolefin coupling agent to provide said composite material; wherein said functionalized polyolefin coupling agent possesses a molecular weight distribution of greater than 2.5 (M_w/M_n by GPC) and comprises a base polyolefin resin that is grafted with a total of more than about 1 mmole of at least one polar monomer per 100 grams of functionalized polyolefin coupling agent.
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2. The process of claim 1 wherein the natural fiber is selected from the group consisting of wood flour, wood fiber, and agricultural fiber.
- 10 3. The process of claim 1 wherein the natural fiber is selected from the group consisting of wood flour, wood fiber, hemp, flax, and kenaf.
4. The process of claim 1 wherein the natural fiber is employed at a level in the range of from about 20 to about 85 weight % based on the total formulation weight of the composite material.
- 15 5. The process of claim 1 wherein the base polyolefin resin is grafted with a total of more than about 5 mmole of at least one polar monomer per 100 grams of functionalized polyolefin coupling agent.
6. The process of claim 1 wherein the base polyolefin resin is grafted with a total of more than about 10 mmole of at least one polar monomer per 100 grams of functionalized polyolefin coupling agent.
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7. The process of claim 1 wherein the polyolefin resin is a polypropylene copolymer comprising a major proportion of propylene combined with a minor proportion of a second monomer selected from the group consisting of ethylene and C₄-C₁₆ monomer materials.
8. The process of claim 1 wherein the polyolefin resin is an ethylene copolymer
5 comprising a major proportion of ethylene and a minor proportion of at least one C₃-C₁₈ monomer.
9. The process of claim 1 wherein the polyolefin resin is polypropylene homopolymer.
10. The process of claim 1 wherein the polyolefin resin is high density polyethylene.
11. The process of claim 1 wherein the polar monomer is selected from the group
10 consisting of ethylenically unsaturated carboxylic acids, ethylenically unsaturated carboxylic acid anhydrides, and derivatives of the foregoing.
12. The process of claim 11 wherein the polar monomer is selected from the group
consisting of maleic acid, fumaric acid, itaconic acid, crotonic acid, acrylic acid, methacrylic acid, maleic anhydride, itaconic anhydride, substituted maleic anhydrides, and derivatives of
15 the foregoing.
13. The process of claim 1 wherein the polar monomer is maleic anhydride.
14. A composite material prepared by a process comprising mixing at least one natural fiber, at least one polyolefin resin, and at least one functionalized polyolefin coupling agent to provide said composite material; wherein said functionalized polyolefin coupling agent
20 possesses a molecular weight distribution of greater than 2.5 (M_w/M_n by GPC) and comprises a base polyolefin resin that is grafted with a total of more than about 1 mmole of at least one polar monomer per 100 grams of functionalized polyolefin coupling agent.
15. A composite material comprising at least one natural fiber, at least one polyolefin

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resin, at least one functionalized polyolefin coupling agent, and at least one lubricant selected from the group consisting of fatty acid amides and fatty acid esters; wherein said functionalized polyolefin coupling agent possesses a molecular weight distribution of greater than 2.5 (M_w/M_n by GPC) and comprises a base polyolefin resin that is grafted with a total of more than about 1 mmole of at least one polar monomer per 100 grams of functionalized polyolefin coupling agent.

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